Cement MILL SECTION of

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New Peerless Cement Plant Has Unique Features

PART I

By DWIGHT F. JENNINGS

To the reader of Concrete who is interested in cement plant construction and who has not seen the new Detroit plant of the Peerless Portland Cement Co., the following description will serve as a guide on an imaginary trip through the various departments. So many complimentary things might be said about the plant that it seemed logical to the writer to mention each step in the manufacturing process and the principal pieces of equipment used, leaving the reader to draw his own conclusions.

To the many who have already visited the plant and are more or less familiar with its mode of operation, this will serve as a "return visit" and will perhaps illustrate in words or pictures, some of the features now completed and which were seen in their earlier stage of construction.

Part 2 in the next issue of Concrete will conclude the description.

In arranging the layout of the new Peerless Portland cement plant at Detroit, Mich., the procedure followed was just the reverse of modern cement plant practice where the straight line design is followed. Ordinarily the plant is designed and the surroundings made to fit the layout, but in the design of the new Peerless plant the problem that had to be solved was that of fitting a plant of the desired capacity to a site roughly triangular in shape with Jefferson Avenue on one side, the Rouge River on another and the property of a paper mill on the south.

The first point to be decided was that of getting railroad connections for shipping clay to the plant and for rail shipments of the finished cement. The site of the plant was formerly occupied by a lumber yard and planing mill and was served by a spur track connecting to the Michigan Central railroad. The accompanying sketch shows how the tracks were placed so as to provide sufficient car storage and at the same time permit incoming shipments of clay. Foresight was exercised to make the track scheme such that it can be easily connected to the trolley tracks on Jefferson Avenue at some later date so that shipments of cement can be made by interurban electric trains or cars to connecting points or anywhere within the city served by trolley.

With the track layout determined, the clay storage was next planned to give a location accessible to the tracks, and the cement warehouse position determined adjacent to the tracks to permit loading of the cars direct from the pack house. An outlet for further shipments by motor truck was also taken into consideration in the location and design of the cement warehouse, as it is planned to ship large quantities of cement to local jobs by motor truck. Eventually the cement will also be shipped by water and special equipment will be installed.

The finish mills were placed in close proximity to the warehouse to preclude the necessity for conveying the cement any great distance to storage.

The next department to be determined upon was the limestone storage. It was desired to have the biggest possible stone storage, as the stone is received in cargo lots brought to the plant by lake steamers and sufficient stone storage to last during the winter season when navigation is closed was necessary. This factor led to the decision to place the stone storage as shown on the sketch.

The kiln building and waste heat boilers were placed against the coal and clinker storage, with the kilns parallel to the long axis of the storage space. In the remaining space to the north, the waste heat power house and machine shop were placed, the power house being convenient to the boilers and the shop being easily accessible from the other departments such as the kiln room, where possible repairs may be necessary to heavy machinery.

The raw mills and slurry tanks remained to be pro-

Fig. 1—Steamer W. F. White unloading limestone at Peerless Portland Cement Company's dock

Fig. 2—Inclined limestone conveyor over roof of raw grinding building

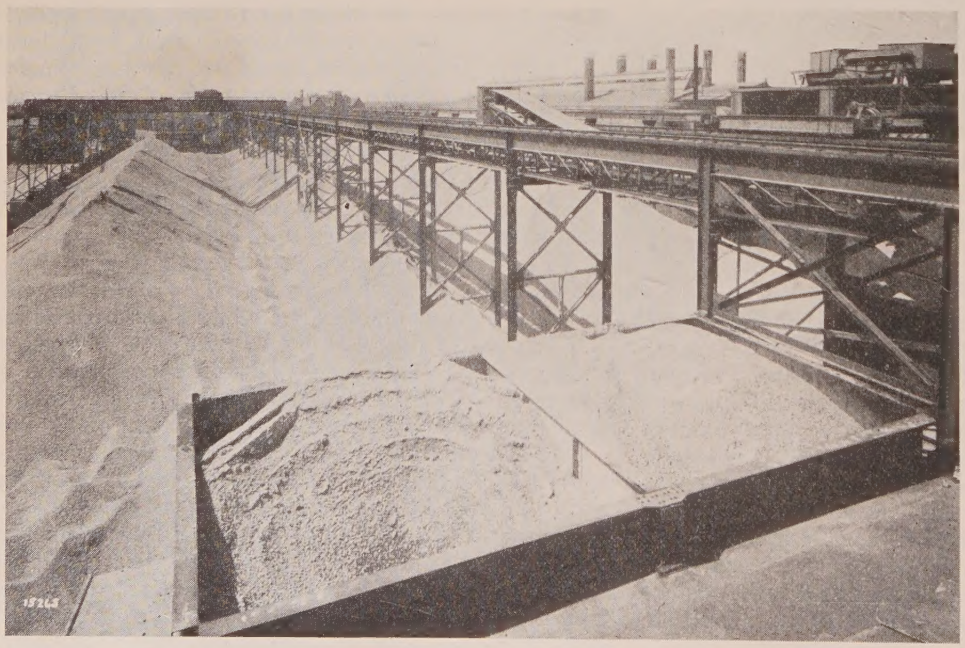
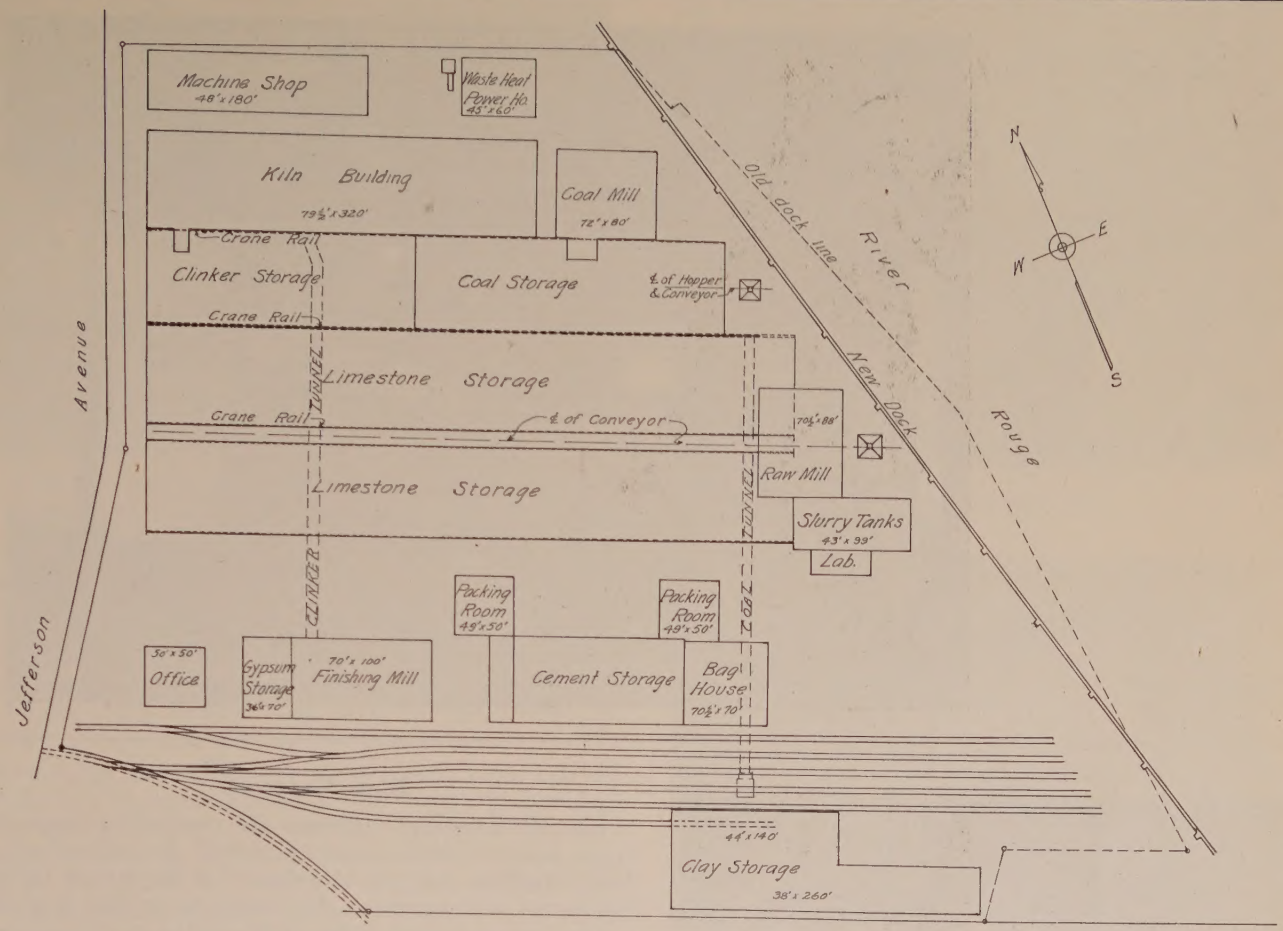


Fig. 3—General view of limestone storage from roof of raw grinding building



Sketch showing outline of Peerless company's property and general layout of different departments

vided for and these were so placed that they fit into the scheme for handling the materials and conserve on ground space.

The location of the plant within the city limits of Detroit and within a few feet of a main east and west thoroughfare necessitated a special provision and the design adopted for the buildings provides not only permanent construction but also a pleasant appearance. A lack of dust is particularly noticeable, which takes care of what might otherwise prove an objection to a cement plant so located.

The Rouge River with a navigable channel from the Detroit River past the plant gives access to the plant for the largest stone carriers on the lakes. With both water and rail facilities for shipping in the bulky materials, limestone, clay and coal, and for shipping out cement in sacks or in bulk, the plant is strategically located within a district that not only requires a large supply of cement for local use but also requires heavy shipments to the adjacent counties and municipalities.

The rated capacity of the Peerless plant is 4,500 bbls. per day, utilizing clay, limestone screenings, caustic waste and gypsum as raw materials by the wet process. It is scheduled to operate with 134 men for capacity production, that number including plant office force and the men in the clay field.

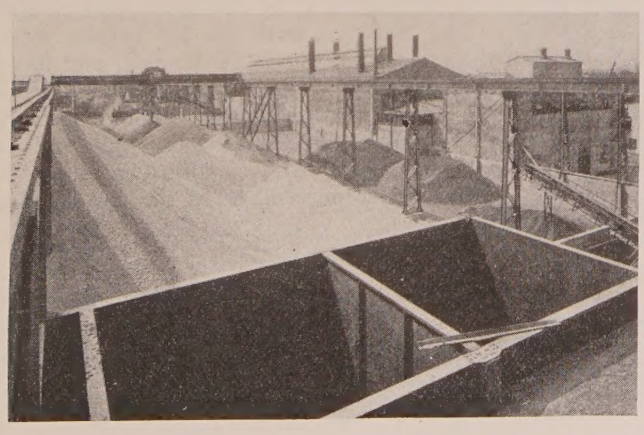


Fig. 4—Limestone storage and coal storage on the right

Fig. 5—Traveling tripper discharging limestone into storage

Fig. 6—Clay storage with wash mill in the background

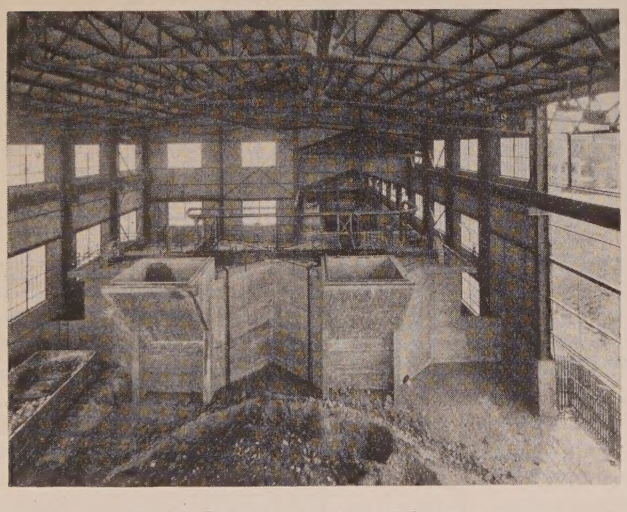


Fig. 7—Interior of clay mill department

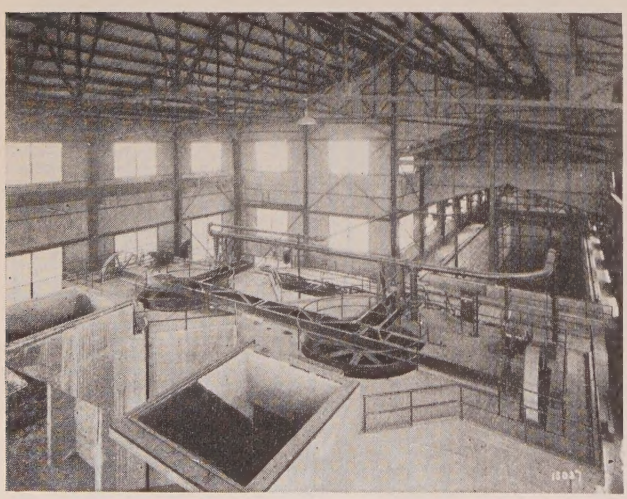


Fig. 8—Smidth wash mill and clay receiving hoppers

Raw Materials

Limestone quarry screenings are received in cargo lots from Calcite, Mich., being delivered by self-unloading bulk freighters that can be unloaded at the rate of 10,500-ton cargo in five hours. The conveyor on the boat discharges into a hopper at the dock and the stone is carried on a 54 in. belt[1] Stearns conveyor[2] over the roof of the raw grinding mill building to be deposited in storage by a traveling tripper on the main belt conveyor which operates on 610 ft. conters and handles the stone at the rate of 30 tons per hour. As it is discharged by the traveling tripper, the stone is picked up by one of two Whiting 3-yd. traveling cranes[3] and further distributed to storage or deposited in the feed hoppers of raw grinding mills. The two cranes each serve one-half of the 150,000 ton limestone storage, the crane rails being parallel to the center line of the belt conveyor with the traveling tripper. The limestone storage occupies an area 172 ft. wide and 550 ft. long.

Alkali or caustic waste is pumped across the Rouge channel by the Solvay Process Co. from the nearby Solvay works. As received it is 65% water. The solid material which has a composition that permits its use in substitution for about 30% of limestone in the cement manufacturing process is in the form of 200-mesh precipitated caustic waste. The receiving tank for the caustic waste at the end of the main pipe line is 18 ft. deep and has a capacity of 2000 cu. yds. The waste is stirred by a Smidth traveling slurry agitator[4] and by air, and pumped from the receiving tank to the Smidth clay wash mill to be used in making the clay slip. Additional water is added to give the proper percentage to the slip coming from the wash mill.

Clay

Clay is obtained at the company's clay field near Wayne, Mich., and shipped in standard gauge cars over the Michigan Central Ry. to the plant. A Bucyrus dragline ex-

[1] Gutta Percha & Rubber Mfg. Co., New York City, N. Y.
[2] Sterns Conveyor Co., Cleveland, Ohio.
[3] Whiting Corporation, Harvey, Ill.
[4] F. L. Smidth & Co., New York City, N. Y.

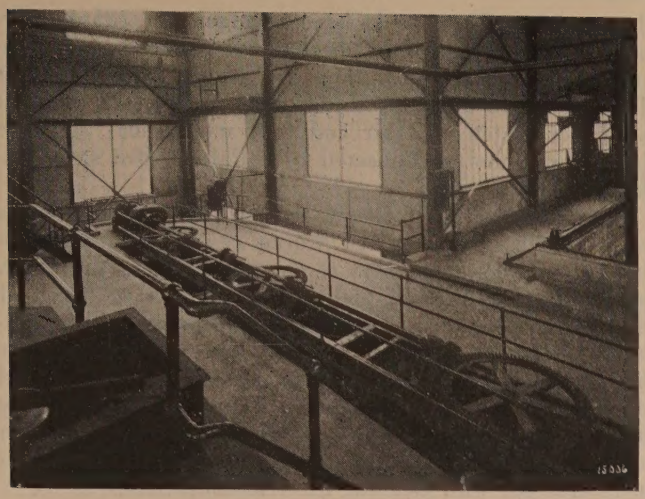


Fig. 9—Washed clay storage basin and agitators

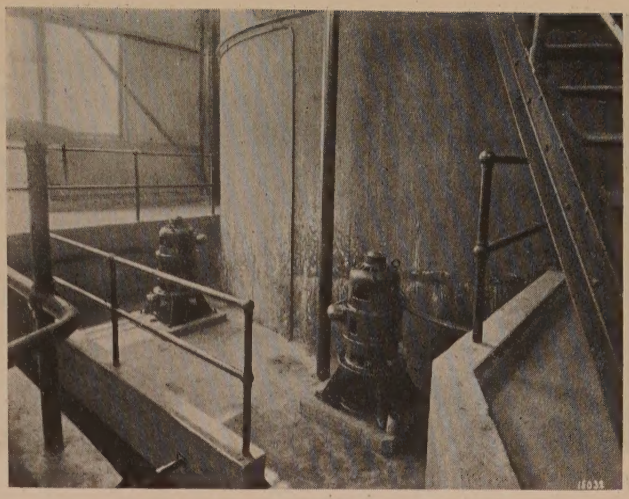


Fig. 11—Washed clay pumps

cavator[5] is used to load the cars. At the clay storage the clay is unloaded from the cars by an overhead Whiting 3-yd. crane which also feeds the clay to the hoppers of the Smidth wash mill, where the necessary water and caustic waste are added. From the wash mill the clay slip flows by gravity through a screen and is pumped from the mechanically agitated tank to the grinding room into the feed troughs over the raw grinding mills.

As the clay slip comes out of the supply pipes into the troughs it is screened through a wire mesh with openings about ¾ in. square. The overflow from the clay feed troughs flows back to the clay room. At the same time that the clay slip is fed to the raw grinding mills through nozzles directly beneath the feed troughs, the limestone is fed to the same mills by means of rocker feeds connected with the limestone feed hoppers served by the traveling crane in the stone storage. Each of the two feed troughs serves two grinding mills and both are agitated

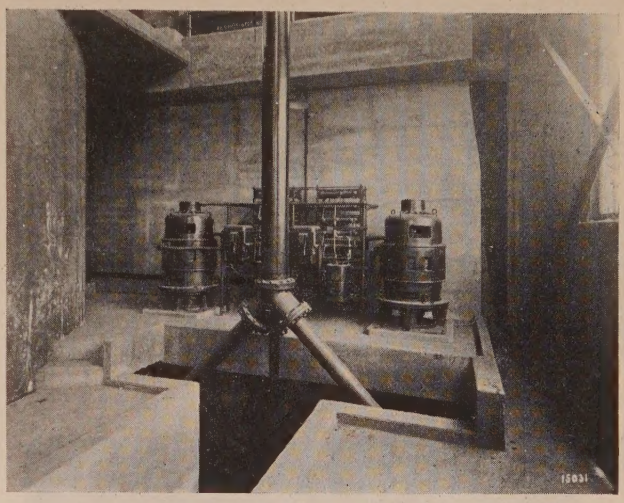
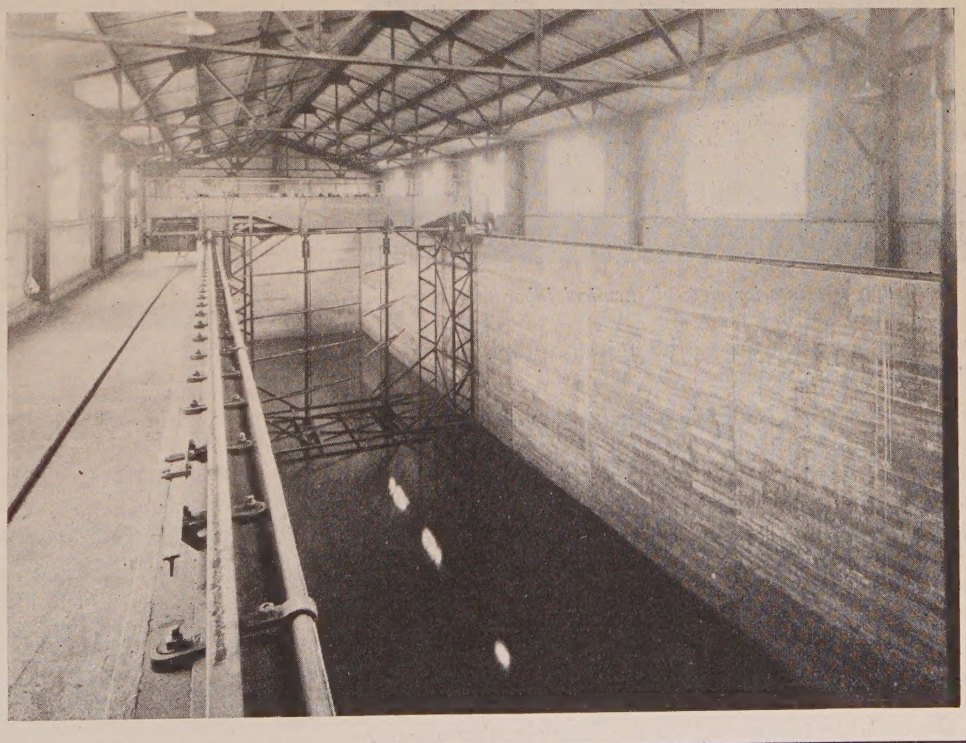


Fig. 12—Solvay waste pumps

[5] The Bucyrus Co., South Milwaukee, Wis.

Fig. 10—Solvay waste tank and Smidth traveling agitator



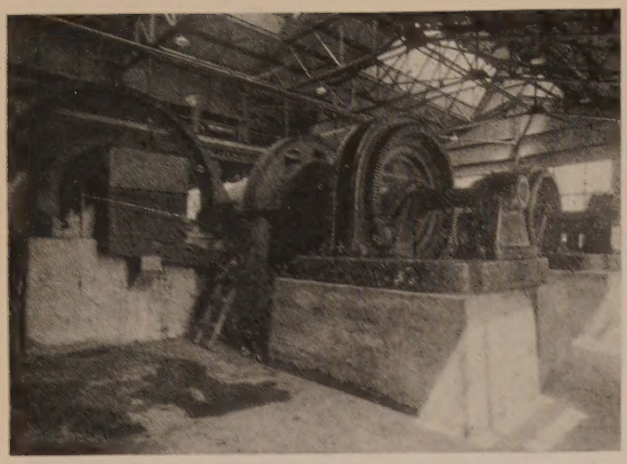


Fig. 13—Raw grinding mills showing inclined discharge trough for slurry

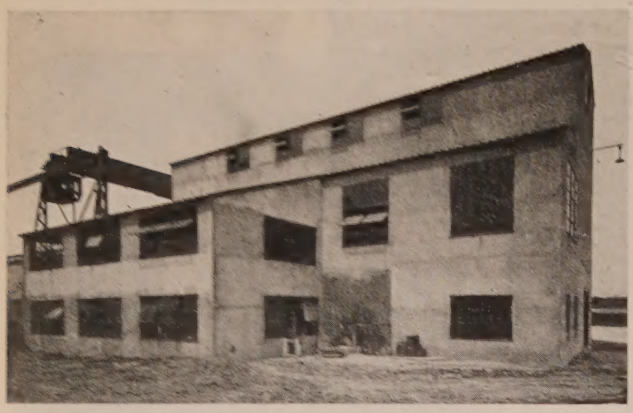


Fig. 14—East view of laboratory and slurry tank building

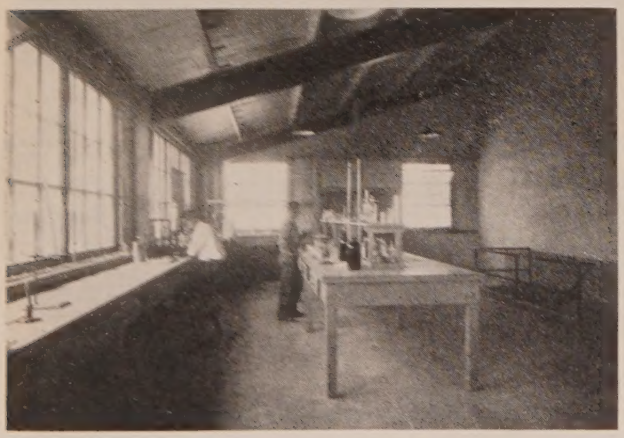


Fig. 15—Interior view of chemical laboratory

by one motor which drives the agitators through a Link-Belt silent chain drive.

Raw Grinding

The raw grinding mills are Traylor three-compartment mills,[6] 7 ft. by 26 ft., each driven by a 500 h.p. Ridgway synchronous motor[7] through a 60-in. Cutler-Hammer magnetic clutch.[8] There are three raw mills with provision for an additional unit. Each mill has a charge of 40 tons of balls, the sizes of balls in the three different compartments being 4 in., 2½ in. and 1 in.

The slurry flows from the three mills through an inclined trough to the pump pit and from thence it is pumped by a Morris horizontal pump[9] driven by a 30 h.p. General Electric motor[10] to the four circular concrete slurry tanks. These tanks have a capacity of 225 cu. yds. each and are agitated by mechanical agitators and compressed air. The slurry flows by gravity from the four slurry tanks to the 800 cu. yd. correcting basin where it is further agitated by air and four mechanical agitators driven by a motor connected to a Palmer Bee speed reducer.[11]

From the correcting basin the properly mixed slurry is pumped by motor driven Morris centrifugal pumps to the slurry tanks in the kiln room. These tanks are 18 ft. deep with a capacity of 600 cu. yds. of slurry. Each of these three tanks under the kiln is triple agitated, the agitators being driven by a 25 h.p. General Electric motor through a No. 244 Palmer Bee speed reducer with a speed ratio of 15.7 to 1. Two vertical motor driven slurry pumps are installed, one being held in reserve as an auxiliary, each driven by a 40 h.p. General Electric induction motor with General Electric controller.

The slurry is pumped through the pipe line to the elevated slurry trough over the feed end of the kilns and an overflow pipe returns the excess slurry to the slurry tanks. The kiln feed trough has a continuous agitator driven by a 5 h.p. General Electric motor connected to a No. 164 Palmer Bee speed reducer. The kilns are each fed through a nozzle which discharges slurry into a water jacketed kiln feed pipe. The size of nozzle can be varied at will.

The slurry as it is fed to the kilns contains 32% moisture.

[6] Traylor Engineering & Mfg. Co., Allentown, Pa.
[7] Ridgeway Dynamo & Engine Co., Ridgway, Pa.
[8] Cutler Hammer Mfg. Co., Milwaukee, Wis.
[9] Morris Machine Works, Baldwinsville, N. Y.
[10] General Electric Co., Schenectady, N. Y.
[11] Palmer Bee Co., Detroit, Mich.

(To be concluded in October issue)

This Belgian Cement Offered in America

L.-A. Gony & Co., Brussels, are offering portland cements to American buyers, and are quoting in any quantity f.o.b. Antwerp or c.i.f. Because of conflicting reports concerning cement that is being imported to this country it might be of interest to see the report of tests accompanying one of the sales letters of this firm. The report, accredited to the Robert W. Hunt Company, follows:

ROBERT W. HUNT COMPANY
Bureau of Inspection Tests and Construction
LONDON

RESULT OF TESTS ON ONE SAMPLE OF CEMENT SUBMITTED BY ESTABLISSEMENTS L. A. GONY & CO., BRUSSELS

Initial Set—Gilmore Needle	3 hrs. 30 miu.
Initial Set—Vicat Needle	2 hrs. 30 min.
Final Set—Gilmore Needle	4 hrs. 45 min.
Final Set—Vicat Needle	4 hrs. 30 min.

Fineness: 200x200 sieve 20.5%.
Steam test: Satisfactory.

PHYSICAL TESTS

1 Cement x 3 sand

BRIQUETTES

7 days	28 days
Lbs. per sq. in.	Lbs. per sq. in.
275	410
300	415
310	410
295	380
300	400
315	385
299 Average	400

CHEMICAL ANALYSIS

Insoluble residue	0.19
Silica	22.39
Alumina	5.68
Oxide of iron	3.15
Lime	63.14
Magnesia	1.40
Sulphuric anhydride	1.68
Alkalies and loss	0.46
Loss on ignition	1.91
	100.00

Sand briquetes 10.7

The results of tests reported above conform to the specifications of the American Society for Testing Materials.

New Standard Portland Cement Co. Starts Operation

Complete Plant Constructed in Record Time

The construction of a complete two-unit cement plant and the production of clinker in exactly six months' time is the remarkable record made by the Standard Portland Cement Co. at Painsville, Ohio. A new company was conceived of in January of this year, ground was broken for the plant on the first of February and the first clinker was burned on August 1.

The plant of the Standard Company, with headquarters in Cleveland, Ohio, and which was originally known as the Ohio Portland Cement Co., is located at Painsville adjoining the plant of the Diamond Alkali Co. Part of the raw material used in the manufacturing of cement is limestone screenings purchased from the Diamond Alkali Co. The other raw materials used are clay and gypsum. The clay is obtained locally on the company's property and the gypsum is shipped to the site of the plant by rail.

Limestone is shipped in 10,000-ton self-unloading lake boats from Calcite, Mich., to Fairport Harbor. From the harbor the crushed limestone is transported to the plant over the Fairport, Painsville and Eastern Railroad direct to the plant.

One million barrels annually is the capacity of the plant, which is a wet process plant remarkable for its simplicity of layout and the minimum amount of elevating and conveying required in handling the materials.

As shown in the accompanying illustration, Fig. 2, the arrangement of the different departments has been so worked out as to make the layout compact and yet allow ample space for the equipment and storage, with provision for future expansion. Approximately 75 men will be employed in operating the plant.

Mill Building

The main building is 528 ft. long and 134 ft. wide, constructed of structural steel frame with corrugated metal sheeting. This main building houses practically the entire equipment except that included in the silo stock house and the bag house and pack house. The two structures, which are located convenient to the main building, are reinforced concrete throughout and will be described on the following pages.

Raw Grinding

Clay which is obtained right on the company's property adjacent to the plant site is dug with a McMyler-Interstate crawler crane[1] and transported to the plant in 30-ton standard gauge cars. It is of excellent quality, containing a small percentage of blue shale. Clay is dumped into an inlet chute which discharges by gravity into a Smidth wash mill[2] with a 24-ft. agitator operated by a 50-h.p. General Electric motor,[3] driving the revolving shaft through a Jones speed reducer.[4] Water is added to the clay to make the clay slip which flows by gravity to the two underground concrete tanks 20 ft. in diameter and 15 ft. deep with double agitators. The mechanical agitators are each operated by a 10 h.p. motor running at a speed of 870 r.p.m. connected to a Jones speed reducer with a ratio of 22 to 1. Air is also used, in addition to the mechanical agitators, in agitating the clay slip in the tanks.

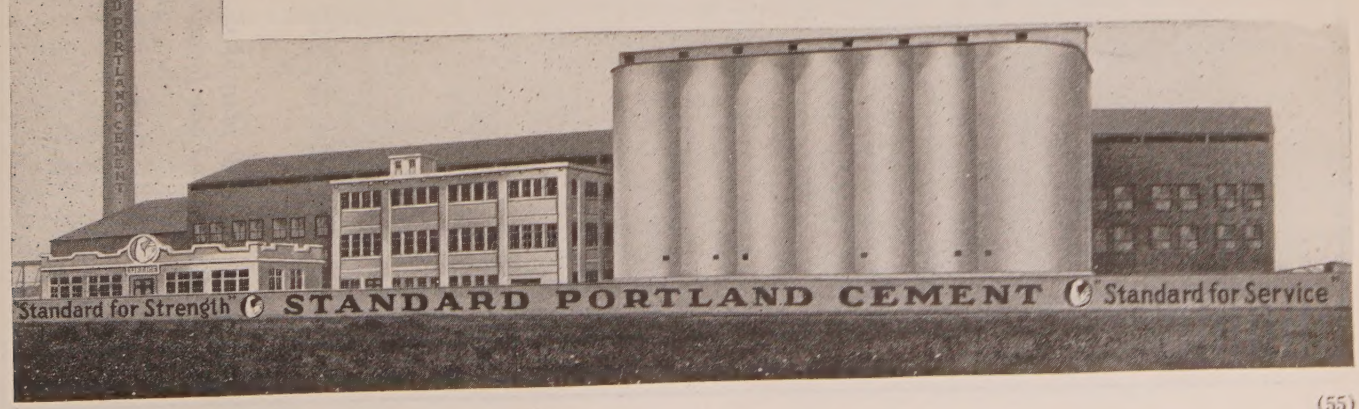
From the tanks the slip is pumped to the grinding mills by a 4-in. vertical slurry pump which is direct connected to a 25-h.p. motor. Two Morris centrifugal pumps[5] are installed, one held in reserve to provide an auxiliary pumping unit.

Limestone

Limestone screenings are received at the plant in sizes ½-in. and under. This material is deposited from the cars into the stone storage where it is handled with a 10-ton Brownhoist traveling crane[6] which operates at a maximum speed of 400 ft. per minute with a span of 80 ft.

[1] McMyler-Interstate Co., Cleveland, Ohio.
[2] F. L. Smidth & Co., New York City, N. Y.
[3] General Electric Co., Schenectady, N. Y.
[4] W. A. Jones Foundry & Machine Co., Chicago, Ill.
[5] Morris Machine Works, Baldwinsville, N. Y.
[6] Brown Hoisting Machinery Co., Cleveland, Ohio.

The new Standard plant as it will appear when the office building is completed



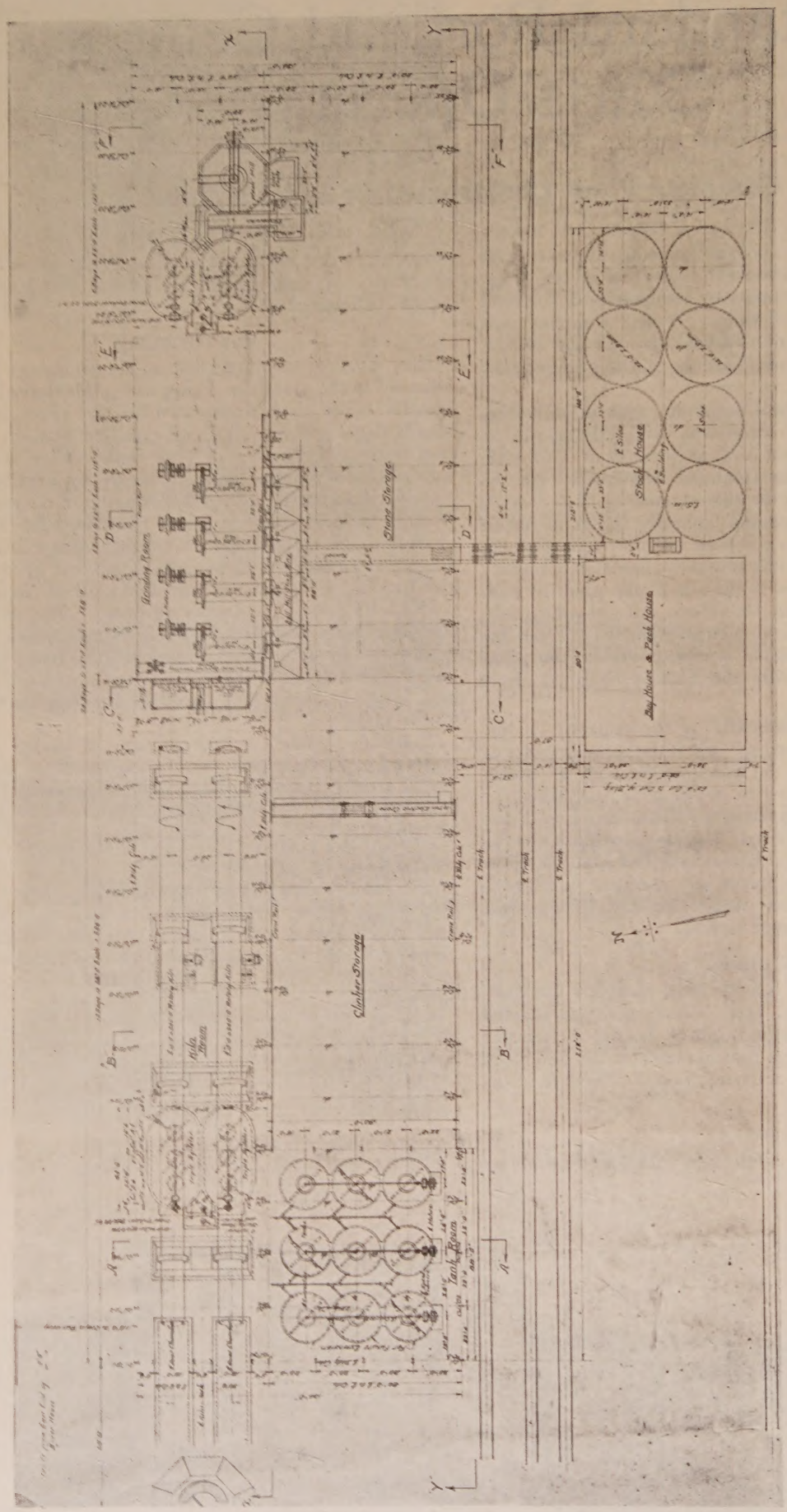


Fig. 2—General plan of the new plant of the Standard Portland Cement Co. at Painsville, Ohio, showing the relative location of the different departments and the location of the tracks with respect to the plant. The arrangement is compact and by designs the details of which are not shown here, the handling of materials in the process of manufacture has been simplified

Fig. 11—The firing end of the two Vulcan kilns

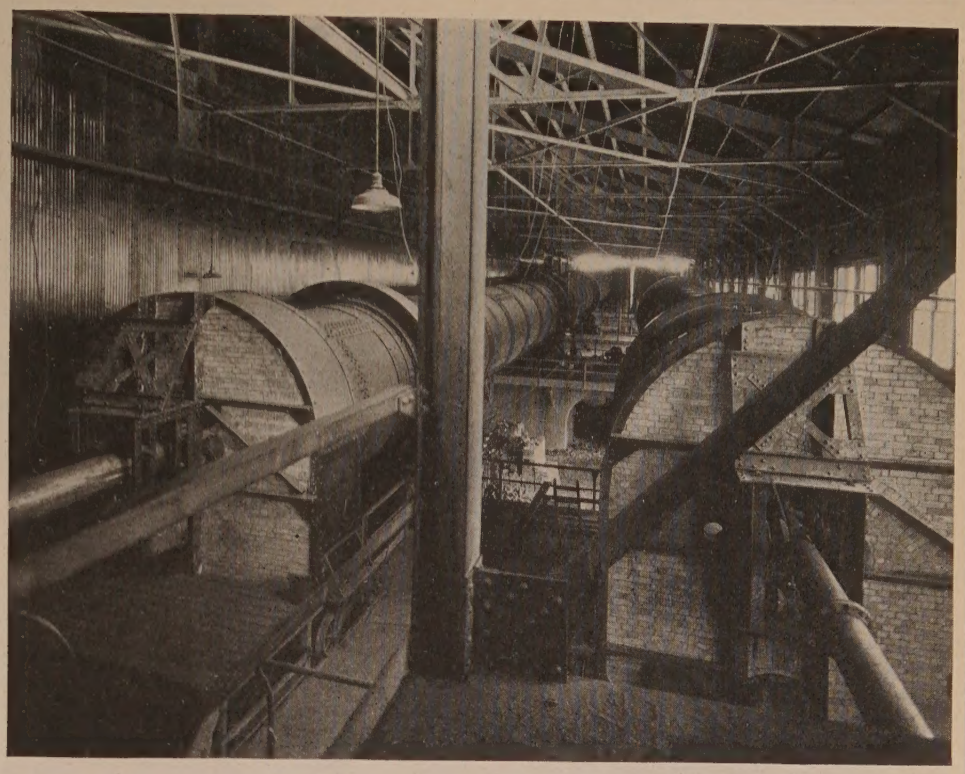


Fig. 3—View of harbor where limestone screenings are received in cargo lots from the quarry on Lake Huron

The length of the crane runway is 460 ft., permitting the crane to serve both clinker and raw material storage. Owing to the regularity with which raw materials are received, the clay and stone storages required are not necessarily large.

When the screenings are received they are dumped through a grate into a track hopper one car at a time, and run through a Pennsylvania hammer mill [7] fed by a bucket elevator and belt conveyor, made by the Variety Iron and Steel Co., Cleveland, Ohio, operating from the track hopper to the feed hopper of the hammer mill. The hammer mill discharges into the boot of another bucket conveyor which elevates the fine material and dumps it over a concrete dividing wall into the storage space, from whence it can be reclaimed by the Brownhoist crane. All storage is inside the main storage building.

Gypsum is handled in a similar manner to limestone and is stored in a separate compartment to be reclaimed as needed. The limestone and gypsum unloading elevators are separate, the gypsum elevator discharging into the 250-ton gypsum storage.

Grinding Room

The grinding equipment includes four Traylor three-compartment ball mills [8] 7 ft. in diameter and 26 ft. long with two feed hoppers for each mill. Two of the parallel mills are wet mills for raw grinding and the other two are for grinding the clinker. Each mill is driven by a 500-h.p. super-synchronous General Electric motor. The grinding room is equipped with a 5-ton hand-operated

[7] Pennsylvania Crusher Co., Philadelphia, Pa.
[8] Traylor Engineering and Manufacturing Co., Allentown, Pa.

Fig. 4—Interior of clay storage showing cars being unloaded at gravity chute to wash mill

Fig. 5—Stone storage in main storage building. At the left is the compartment containing the Pennsylvania hammer mill for reducing the limestone screenings. On the right are shown the steel hoppers into which the stone is deposited by the crane

traveling crane. The clay slip is received through the pipe line from the pumps at the clay slip tank and the crushed limestone is measured by Schaffer poidometers.[9] The clay supply is measured by a ferris-wheel type feeder.

From the raw grinding mills the slurry is pumped by Morris centrifugal pumps to the steel correction tanks in the tank room. These tanks, of which there are six, with provision for three more for future extension, are 20 ft. in diameter and discharge by gravity into two triple agitated kiln basins. The slurry in the correction tanks is both mechanically and air agitated to prevent the finely ground material from settling to the bottom. The agitators in each unit of three correction tanks are driven by a 25-h.p. induction motor connected to a W. A. Jones speed reducer operating at a ratio of 22 to 1.

The kiln basins are 20 ft. by 53 ft. outside dimensions

[9] Schaffer Engineering Co., Pittsburgh, Pa.

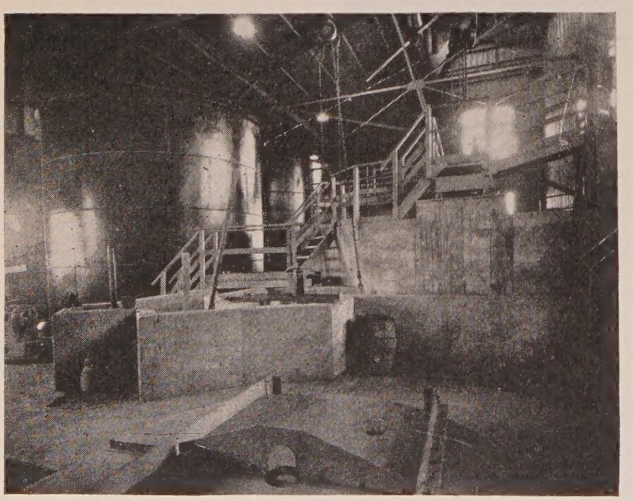


Fig. 6—Wash mill where clay is mixed and from which the clay slip flows by gravity to the two underground tanks

Fig. 7—Two double agitated concrete tanks which receive the clay slip from the wash mill

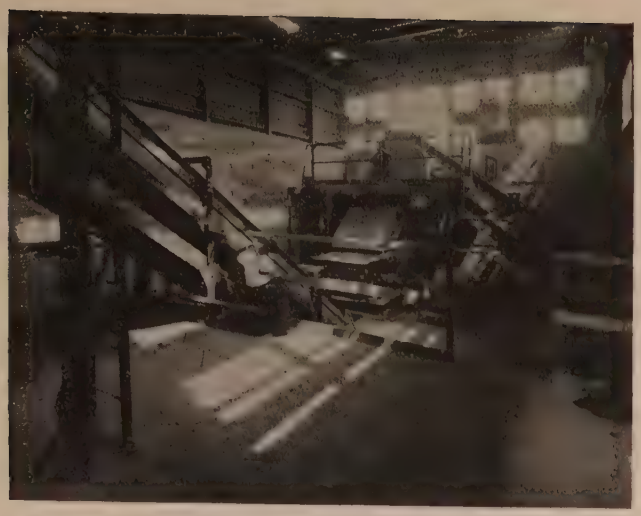


Fig. 8—The Pennsylvania hammer mill which crushes the limestone screenings as they are received from the track hopper

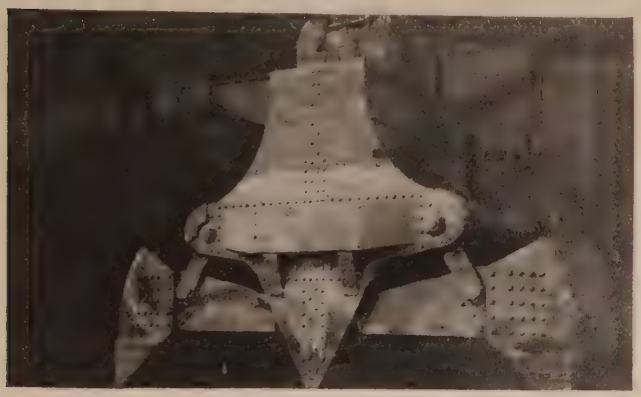


Fig. 9—The bucket lowered by the crane ready for a "bite" of raw materials

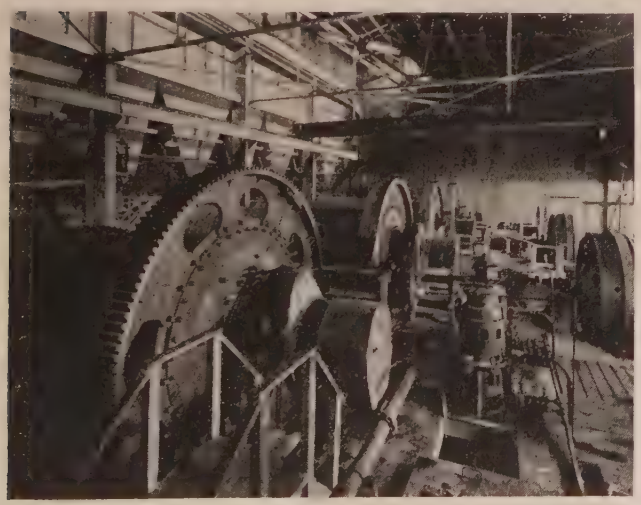


Fig. 10—Interior view of grinding department showing two wet mills and two finish grinding mills, all Traylor three-compartment mills

and are each fitted with a triple agitator driven by a 25-h.p. motor operating at a speed of 900 r.p.m. and connected to a 22 to 1 ratio speed reducer. The corrected slurry flows by gravity into the pump pits and is pumped by a 4-in. direct connected Morris vertical slurry pump into the kiln feed tanks. Two kiln feed pumps are installed as in the case of the clay slip tanks to provide an auxiliary for use in case of emergency.

Kilns

The two Vulcan rotary kilns[10] are each 10 ft. in diameter and 240 ft. long. They are elevated on concrete foundation piers and are immediately over the kiln basins and their operating equipment. The pitch of the kiln is ¼-in. per foot. Each kiln is rotated by a 75-h.p. General Electric motor with a speed reducer having a ratio of reduction of 22 to 1. The speed of revolution at low speed is one revolution every four minutes and at high

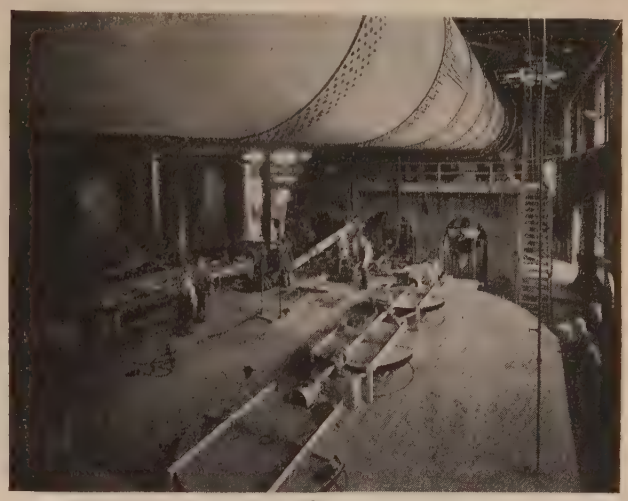


Fig. 11—Interior of kiln building showing also the triple agitated slurry basins from which slurry is pumped to the kiln feed

Fig. 12—Clinker discharging into clinker pit to be distributed

speed one revolution every two minutes. The kilns are lined throughout with firebrick and in the burning zone the fire bricks are backed by Silocel insulating brick.[11]

Brown electric pyrometers[12] connected with the kilns keep a continuous record of kiln temperatures.

Powdered coal for firing the kilns is purchased from the Diamond Alkali Co. and is supplied to the bins or hoppers over the firing end of the kilns by means of a Fuller Kinyon pump.[13] Air for the blast is supplied by two No. 9 American Blower Sirocco fans,[14] one for each kiln, each operated by a 50-h.p. Westinghouse motor.[15] The pipes through which the coal is blown into the firing zone of the kilns is reduced in size to about 5 in. on the jet end. Air for combustion in the kilns is preheated

[10] Vulcan Iron Works, Wilkes-Barre, Pa.
[11] Celite Products Co., Chicago, Ill.
[12] Brown Instrument Co., Philadelphia, Pa.
[13] Fuller Lehigh Co., Fullerton, Pa.
[14] American Blower Co., Detroit, Mich.
[15] Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

by passing over the hot clinker in the clinker conveyor tunnel.

The hot clinker is discharged directly to a clinker conveying system with a drag conveyor operating at right angles to the axis of the kilns, and discharging the hot clinker into a concrete pit in the clinker storage. From this pit the clinker can be picked up by the traveling crane and deposited on the feed hoppers of the clinker mills or it can be distributed in the clinker storage to be reclaimed later by the same crane as needed to supply the clinker mills. A clinker storage capacity equivalent to 250,000 barrels is provided.

(To be concluded in October issue)

The Kiln Room—A Discussion

A Letter from C. O. SANDSTROM

In his discussion of the financial considerations of the kiln room, in the June and July issues of CONCRETE, C. H. Sonntag puts the rotary cooler in a rather bad light. In fact, his figures indicate that the installation of a cooler is an economic blunder. So far from earning money for the plant it seems to be a consistent loser. All of which is proved—by the figures submitted.

There is a popular adage about figures, and the users of figures, that reflects on some users of figures. I wouldn't apply this adage to Mr. Sonntag because I know him to be a man of veracity, as well as one thoroughly qualified to discuss the construction and operation of cement plants. But, however, I would enter a demurrer to his method of handling the economic factors attending the rotary cooler, as it savors of the method of the advocate; that is, as in law where the attorney for either side of a controversy magnifies the faults of the case of the opposition, and ignores whatever there may be of virtue; or at best, damns it with faint praise.

Whether to install coolers has been discussed frequently. Owners of plants having them seem satisfied. Owners of plants without them also seem satisfied. I think there have been few cases where tests with and without coolers have been actually carried out—I know of none. In the absence of data one must arrive at a conclusion by calculation, the accuracy of which will be proportional to the accuracy of the assumed factors.

In the June issue Mr. Sonntag places the cost of a cooler completely installed at $20,000. In the July issue he places the cost of a kiln completely installed at $35,000; the cost of the cooler being 57% of the cost of the kiln which it serves. I think this relation is incorrect. and that 25% is nearer the truth. I believe that the cooler could be installed for less than $10,000.

Another item that I think is unfair to the rotary cooler is the assumption of only a 5% saving in fuel. If 75% of the air entering the kiln comes through the cooler, and 11 lb. of air is used per lb. of 12,000 B.t.u. coal, then a 5% fuel saving represents a temperature rise of the air entering the kiln from the cooler of only $\frac{.05 \times 12{,}000}{11 \times .24} =$ 227° F. This means that the air entering the kiln is at a temperature of only 300° F. The temperature of the air entering kilns has been stated by various writers as upward of 900° F.

Mr. Sonntag's charges of interest, depreciation, obsolescence and taxes against the cooler amount to 20%. I don't believe that obsolescence is a proper charge against a rotary cooler. The only replacements of coolers that I know of have been of larger ones due to the installation of larger kilns. Replacing a small cooler by a larger one does not constitute an advance in the art, and which should necessitate an obsolescence charge. The fixed charges against a rotary cooler should not exceed 15% of the investment.

After making a 20% fixed charge against the investment, Mr. Sonntag would have it earn an additional 15%. If some of the "hicks" that find their way into state law-making bodies ever suspect that cement plants earn 35% gross on the investment, they will proceed forthwith to legislate the hair off the owners!

In Part 2 of his article, Mr. Sonntag states that if the air of infiltration entering the waste-heat boilers by way of the opening between kiln and stack amount to 30% of the total gases it causes a loss of only 5%. Just how this is figured is not explained. If the kiln gases, comprising the gases of combustion, the carbon-dioxide resulting from the decomposition of the limestone, and the super-heated steam, are 14 lb. per lb. of coal burned; and these gases are 70% of the total, the 30% represented by the infiltrating air would be 6 lb. The total weight of gas and air passing through the boiler setting is then 20 lb. per lb. of coal burned. With the temperature of the entering air at 70° F., and the gases leaving the waste-heat system at 350° F., the temperature range for the air is 280°. If the gases from the kiln are at 1,400° F. (dry plant), the available heat per lb. coal burned is 14 (1,400 —350) .24=3,530 B.t.u. The heat removed by the entering air is 6x280x.24=406 B.t.u. and 406÷3530=11½%. Furthermore, the lowering of the temperature of the gases by the infiltrating air seriously affects heat-transfer, to say nothing of the power required to handle the extra supply of air. With the higher temperature of the smaller volume of the gases from the kiln, undiluted by air entering the stack housing, we would expect a lower temperature of the gases leaving the waste-heat system and, consequently, increased efficiency.

The suggestion to get the entire steam supply from the waste-heat boilers by means of extra coal burned in the kilns, in preference to operating a separately fired boiler is, I think, good practice. I once listened to a wail against the waste-heat boiler as applied to cement kilns, by a man who asserted that separately fired boilers would be needed in most plants, etc. It took some argument to convince him that the fuel required to produce the steam above that produced by the ordinary operation of the kiln, could be more economically burned in the kilns. Any loss of efficiency of combustion would be more than compensated for by the avoidance of losses incident to a separately fired boiler, and which are not added to the regular losses of the kiln. These losses are: Radiation from setting; loss represented by ashes if same are not added to the cement mix; wear and tear on the equipment; cost of power for coal and ash handling, and the extra labor required to operate the boiler.

The Fredonia Portland Cement Co. has been sold by F. H. Patterson, of Fredonia, Kans., to W. D. Pratt, of Fredonia and Kansas City, according to reports from Fredonia. Mr. Pratt will become president of the new company. Associated with him will be Governor Ben S. Paulen, as director and treasurer; Stanley Stewart, Kansas City, vice-president, and O. P. Allee, secretary. The Fredonia plant has a capacity of 2,000 bbls. a day and is classed as a big and modern production plant. Mr. Pratt, who has offices in the Waldheim Bldg. in Kansas City is also owner of the Fredonia Brick Works and interested in other Kansas and Kansas City properties.

The June No-Accident Campaign in the Cement Industry

By H. G. JACOBSEN

Manager, Bureau of Accident Prevention and Insurance, Portland Cement Association

The month of December, 1920, saw the first no-accident month campaign in an individual plant of the industry. This campaign was based on the idea that the entire elimination of accidents would never be possible except by a much more intensive appeal to the entire working force. This first campaign was very successful in that there was only one minor accident at the plant during the entire month.

During the following year a great number of cement plants tried out the same idea with equally good results.

In order to bring home the idea of the part the individual plays in accident prevention work, a paper on No-Accident Month Campaigns was read by T. F. Halpin, employment manager, Marquette Cement Manufacturing Co., LaSalle, Illinois, at the Cement Section of the Thirteenth Annual Safety Congress in Louisville.

Mr. Halpin's paper was followed by an exceptionally instructive discussion and the suggestion was advanced that the general methods which would permit a single plant to operate through a month without any accidents could be applied to all cement plants with equally good results. It was, therefore, suggested that all the cement mills in the United States and Canada should be invited to join in a no-accident month campaign in June, 1925.

Through the Bureau of Accident Prevention and Insurance of the Portland Cement Association, where all information and data on accident prevention work in the cement industry is centralized, preliminary steps were taken to get the idea to every cement plant in the United States and Canada. About two months in advance of the time set for the beginning of the campaign a selection of campaign material consisting of buttons, score boards—in the form of calendars—and daily bulletins were prepared and samples sent to all plants. The manner in which the plants ordered this material promised well for a lively campaign. By the first of May orders had been received for 35,000 buttons, 40,000 bulletins and 800 calendars. All this material was shipped so that the allotments for each plant were on hand well in advance of June 1.

In addition to the material furnished by the Association's Bureau of Accident Prevention and Insurance, many plants devised very novel bulletins and other features that would tend to keep the idea before the men every minute during the month.

It was also recommended that in advance of the campaign, steps should be taken whereby each and every workman would be sure to know about the campaign, what was expected, and to have all the rules governing the campaign. In several cases, mass meetings were called for these purposes and in other instances, individual letters were prepared and distributed either at the plant or by mail.

It was rather difficult to keep track of the campaign as it progressed on account of the great number of plants involved and the area covered. Most plants, however, announced their progress by telegrams at the end of each week.

In order to get a final check immediately after the campaign, all members wired July 1, giving the final result, either stating that they had no accidents or gave the number of accidents with the approximate number of days lost.

One hundred and twenty-five plants entered the campaign and 72 of them were able to report at the end of the month that they had had no time lost because of accidents.

Comparing with the month of June, 1924, the following was accomplished:

	Accidents	Days Lost
June, 1924	275	4214
June, 1925	92	1453
Reductions	183	2761
	66%	65%

In starting the campaign, although it was called the June No-Accident Month Campaign, we, of course, did not imagine that all of the plants would come in with perfect scores. The result is mighty gratifying in that it proves our contention that accidents are preventable to a much greater extent if the problem is tackled from the right angle—the men.

The June, 1925, No-Accident Month Campaign, aside from resulting in fewer accidents than during any previous month in the history of the cement industry, had a greater importance in that it served to create a remarkable accident prevention spirit which should result in a very material reduction in accidents during the remainder of the year.

Portland Cement Output in July, 1925

Production and shipments of portland cement reached new high levels during the month of July, according to statistics compiled by the Bureau of Mines, Department of Commerce. Production shows an increase of more than 11% and shipments more than 9% over July, 1924. Stocks of portland cement decreased considerably but are nearly 13% higher than in July, 1924. The output of three new plants, located respectively in Georgia, Michigan and Ohio is included for the first time in the statistics. The following tables, prepared by the Division of Mineral Resources and Statistics of the Bureau of Mines, are based mainly on the reports of producers of portland cement. The July, 1925, totals include estimates for one plant.

PRODUCTION, SHIPMENTS AND STOCKS OF FINISHED PORTLAND CEMENT BY DISTRICTS IN JULY, 1924, AND 1925, AND STOCKS IN JUNE, 1925, IN THOUSANDS OF BARRELS.

Commercial District—	Production July		Shipments July		Stocks at end of July		Stocks at end of June
	1924	1925	1924	1925	1924	1925	1925*
Eastern Pa., N. J. and Md	3,418	3,703	4,205	4,564	2,734	2,460	3,321
New York	718	838	962	1,045	784	778	985
Ohio, West. Pa. and W. Va.	1,503	1,618	1,955	1,754	1,193	1,599	1,735
Michigan	1,058	1,223	1,100	1,322	528	967	1,065
†Wis., Ill., Ind. and Ky.	2,166	2,249	2,570	2,743	1,950	2,611	3,106
Va., Tenn., Ala. and Ga.	962	1,230	1,109	1,375	606	264	410
East. Mo., Ia., Minn. & S. D.‡	1,333	1,444	1,633	1,846	2,110	2,406	2,808
West. Mo., Neb., Kan. & Okla.	935	1,110	993	1,187	1,137	1,539	1,615
Texas	409	454	442	463	264	232	241
Colo. and Utah	273	246	293	208	167	381	343
California	986	1,122	1,025	1,139	326	435	451
Ore., Wash. and Mont.	268	404	327	485	520	248	329
	14,029	15,641	16,614	18,131	12,319	13,920	16,409

*Revised. †Began producing June, 1924. ‡Began producing December, 1924, and shipping January, 1925.

Stocks of clinker, or unground cement, at the mills at the end of July, 1925, amounted to about 6,967,000 bbls. compared with 7,937,000 bbls. (revised) at the beginning of the month.

Month—	Production 1924	Production 1925	Shipments 1924	Shipments 1925	Stocks at end of month 1924	Stocks at end of month 1925
January	8,788	8,856	5,210	5,162	14,155	17,656
February	8,588	8,255	5,933	6,015	16,815	19,689
March	10,370	11,034	8,995	10,279	18,189	20,469
First quarter	27,746	28,145	20,138	21,456	.....	.....
April	11,726	13,807	12,771	14,394	17,159	19,877
May	13,777	15,503	14,551	16,735	16,403	18,440
June	13,538	15,387	15,036	17,501	14,903	†16,409
Second quarter	39,041	44,697	42,358	48,630	.....	.....
July	14,029	15,641	16,614	18,131	12,319	13,920
August	15,128	.....	16,855	.....	10,666	.....
September	14,519	.....	16,827	.....	8,404	.....
Third quarter	43,676	.....	50,296	.....	.....	.....
October	14,820	.....	17,160	.....	6,073	.....
November	13,141	.....	10,289	.....	8,928	.....
December	10,435	.....	5,506	.....	13,913	.....
Fourth quarter	38,396	.....	32,955	.....	.....	.....
	148,859	.....	145,747	.....	.....	.....

†Revised.

EXPORTS OF HYDRAULIC CEMENT BY COUNTRIES, IN JUNE, 1925*

Exported to—	Barrels	Value
Canada	2,439	$8,539
Cuba	17,816	42,215
Other West Indies	1,412	4,117
Mexico	10,400	29,421
Central America	3,854	11,663
South America	31,409	97,851
Other countries	4,013	24,093
	71,343	$217,899

IMPORTS AND EXPORTS OF HYDRAULIC CEMENT, BY MONTHS, IN 1924 AND 1925

	IMPORTS				EXPORTS			
	1924		1925		1924		1925	
Month—	Barrels	Value	Barrels	Value	Barrels	Value	Barrels	Value
January	153,839	$250,799	229,838	$361,098	88,586	$252,497	71,596	$207,547
Feb.	162,930	219,588	119,077	206,308	62,606	194,110	56,249	181,356
March	160,517	254,745	218,054	374,839	91,224	254,687	65,248	200,410
April	148,137	227,300	197,686	280,826	83,200	229,193	89,508	263,831
May	161,304	232,950	186,897	286,959	88,850	262,290	85,385	250,845
June	196,655	283,112	254,937	409,539	74,064	229,852	71,343	217,899
July	108,944	181,111	†	†	60,139	186,073	†	†
Aug.	192,634	305,690	.....	.....	85,883	251,904	.....	.....
Sept.	138,369	232,991	.....	.....	69,470	206,921	.....	.....
Oct.	214,987	337,199	.....	.....	79,180	253,479	.....	.....
Nov.	198,806	305,598	.....	.....	42,490	130,519	.....	.....
Dec.	173,814	285,481	.....	.....	52,851	163,639	.....	.....
	2,010,936	3,116,564	.....	.....	878,543	2,615,154	.....	.....

DOMESTIC HYDRAULIC CEMENT SHIPPED TO ALASKA, HAWAII AND PORTO RICO IN JUNE, 1925.

	Barrels	Value
Alaska	2,262	$6,315
Hawaii	11,483	27,107
Porto Rico	3,440	7,973
	17,185	41,395

†Compiled from records of the Bureau of Foreign and Domestic Commerce and subject to revision. ‡Imports and exports in July, 1925, not available.

Imports and Exports

IMPORTS OF HYDRAULIC CEMENT BY COUNTRIES AND BY DISTRICTS IN JUNE, 1925

Imported from—	District into which imported.	Barrels	Value
Belgium	Massachusetts	18,021	$35,175
	New York	608	1,200
	South Carolina	4,259	5,665
	Florida	65,854	99,859
	New Orleans	5,963	9,292
	Los Angeles	46,093	82,869
	San Francisco	143	177
	Oregon	13,309	17,176
	Washington	11,462	20,292
	Total	165,712	$271,705
Canada	Maine and New Hampshire	500	$1,407
	Vermont	5,082	7,594
	St. Lawrence	3,295	5,196
	Rochester	3,479	4,373
	Buffalo	6,750	11,416
	Total	19,106	29,986
Denmark			
France	Porto Rico	8,442	12,523
	New York	.....	32
Germany	New Orleans	840	$ 816
Norway	Maine and New Hampshire	4,039	$ 4,380
	Massachusetts	12,028	19,200
	San Francisco	2,991	4,928
	Washington	16,996	27,130
	Hawaii	24,533	38,223
	Total	60,587	93,861
United Kingdom	Los Angeles	202	554
	Porto Rico	48	62
	Total	250	616
	Grand Total	254,937	$409,539

American Cement Duty-Free in Russia

American cement is now admitted duty free into the Soviet Union, according to Order No. 63 of the People's Commissariat of Foreign Trade, a copy of which has just been received by the Russian Information Bureau in Washington.

The order relating to American cement was published by the Customs Tariff Committee of the Commissariat of Foreign Trade at the end of April, as a result of a decree of the Council of People's Commissars, adopted in March, reading as follows:

"The customs Tariff Committee is empowered to establish the duty-free entry of cement into the Union of Socialistic Soviet Republics when imported directly from nations permitting cement from the Union of S. S. R. to enter their own territories duty-free."

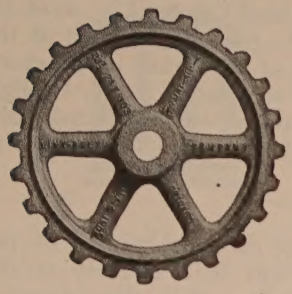
Russian Cement Exported

The Soviet Union has begun to export portland cement, according to advices received by the Russian Information Bureau, in Washington. Since January 1 orders have been received abroad for 201,000 barrels of which 50,000 barrels had been exported by May 1. The Trade and Industrial Gazette (Moscow) reports that the market has proved particularly brisk in the Near East. The product has been of the highest quality. Russia's pre-war exports of cement were insignificant.

New Cement Works at Northfleet

The foundation stone of the largest portland cement works in the United Kingdom has just been laid at Bevans, Northfleet. The work is being put in hand by the directors of the Associated Portland Cement Manufacturers, Ltd., in pursuance of their policy of keeping ahead of the rapidly increasing demand for cement which has been brought about by the Government housing experts' recent pronouncement in favor of concrete construction. The building of the new factory will be proceeded with night and day in order to ensure completion at the earliest possible moment. The works will have an output capacity of no less than 10,000 tons of cement a week, or 500,000 tons a year, which is equal to nearly one-sixth of the total cement production of Great Britain. The site covers an area of several square miles and contains an almost unlimited supply of chalk and clay, which will be mixed in the quarries themselves and pumped through massive pipes to the manufacturing plant. For many decades a smaller factory, now in process of demolition, has been producing cement on this site. For the new factory there is a wide frontage on the River Thames, and a 600 ft. long jetty is to be built to enable large steamers to come alongside at all states of the tide. They will arrive loaded with coal—half a ton of which is used for every ton of cement produced—and load up with cement for coastwise and export trade. The installation of up-to-date plant, the presence on the spot of raw materials, the accessibility of the works by rail and steamer, and various other advantages are distinctly favorable to economical manufacture, and the company believe that cement will be produced at their new works more economically than at any other works in the country—*Ferro Concrete.*

Power requirements are greater in the United States than they were at this time last year. In May there were 5,189,189,000 kilowatt-hours of current produced, while the June consumption totaled 5,203,792,000 kilowatt-hours. This was an increase of 8% over May of last year, and an increase of 15% over June of last year.



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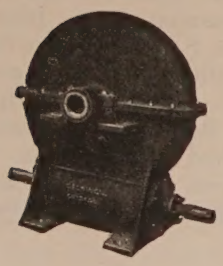

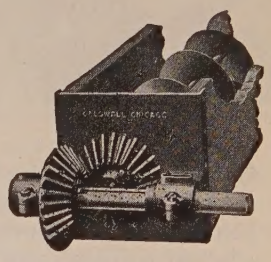

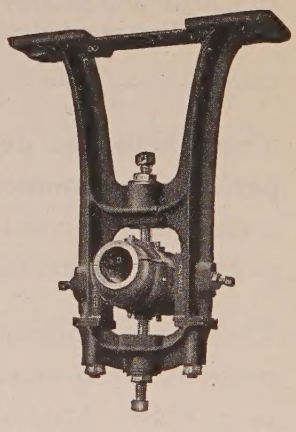

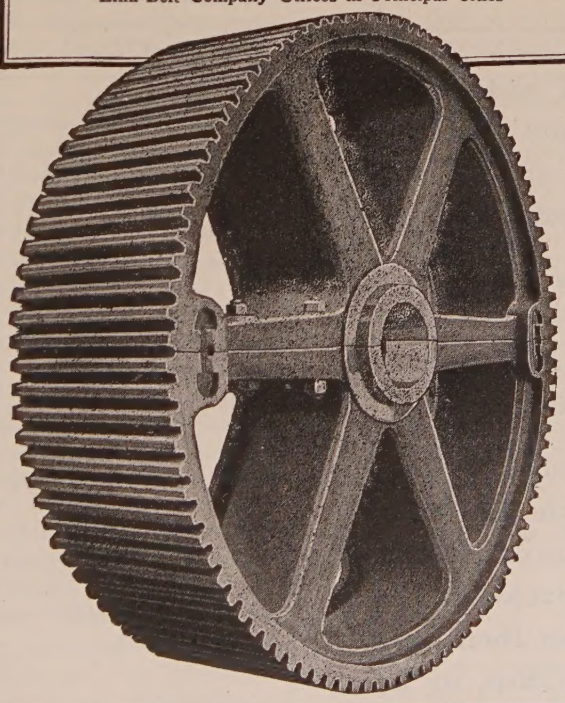

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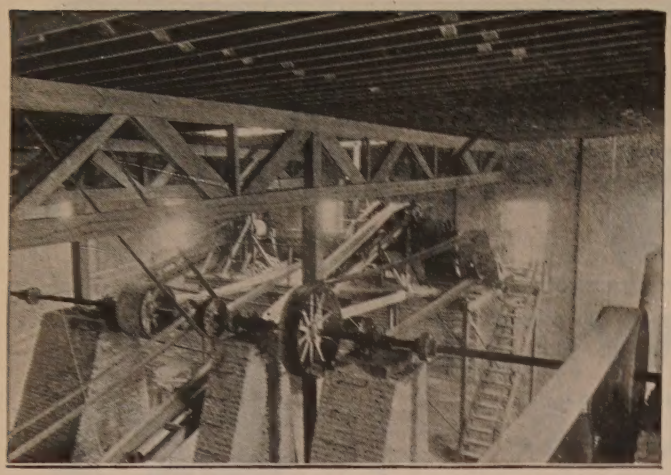

GOODYEAR MEANS GOOD WEAR

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Goodyear makes specially strong and abrasion-resisting belts for the cement industry—conveyor belts for the economical handling of rock, and efficient transmission belts for crusher, grinder, kiln, dryer and finisher drives, and for packing and loading machines.

These belts are designed and built to perform economically and efficiently under severe conditions of load, temperature and grit-laden atmosphere.

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Goodyear Means Good Wear

GOODYEAR

Men and Mills

Notes from the Field

The names of new officers to fill the vacancy caused by the recent death of T. J. Hyman, former secretary and treasurer of the Universal Portland Cement Co., were announced on August 20 by B. F. Affleck, president of the company, following a meeting of the board of directors. E. B. Harkness was elected secretary; A. W. Carlisle was elected treasurer; O. N. Lindahl was appointed assistant secretary, which office he will occupy in addition to the office of auditor.

The 26th annual meeting of the stockholders of the Dexter Portland Cement Co. was held recently at the company's offices at Nazareth, Pa., when the following directors were elected for the ensuing year: John A. Miller, Joseph Brobston and Peter S. Trumbower, Nazareth; Mark T. Swartz and Dr. William F. Cope, Easton; Frank A. Pfaelzer and George E. Bartol, Philadelphia. The directors will organize later. Reports were presented showing that the company has had a prosperous year and the outlook for the coming year is most promising. John A. Miller, of Nazareth, is president of the corporation.

C. Gilbert Norton has been appointed assistant advertising manager of the Lehigh Portland Cement Company, Allentown, Pa. For the last three years he has been advertising manager of the Economy Fuse & Manufacturing Co., Chicago.

Merger of the Security Cement and Lime Co., with plants at Hagerstown, Md., and Berkeley, W. Va., and the Helderberg Cement Co., with a plant at Howes, near Albany, N. Y., through the formation of a new corporation to be known as the North American Cement Corp., with assets of more than $12,000,000, was announced in New York late in August. Frederick W. Kelley, for a number of years executive head of the Helderberg company, will be president of the new corporation, and Loring A. Cover, for 15 years president of the Security Cement and Lime Co., will be vice-president, the report states. Nicholas F. Brady and Robert C. Pruyn are on the board of directors. Capitalization of the new company, upon the completion of the financing to be announced shortly, will consist of $6,000,000 outstanding sinking fund gold debentures, Series A, 6½%, with detachable stock purchase warrants; $3,500,000 outstanding shares of 7% cumulative preferred stock of $100 par value, and 125,000 outstanding shares of no par value common stock.

Gulf States Portland Cement Co. has been reorganized and offices will be moved to Chattanooga. The company's plant at Demopolis, Ala., will be improved and enlarged, and name changed to Warrior Portland Cement Corp. About $750,000 is to be spent in installing new machinery, and increasing the capacity of the plant. Bonds to this amount are to be issued. Reports from Demopolis are to the effect that A. C. Deer, Chattanooga, Tenn., is president of the new corporation.

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